Reed, Angel

From: Harrigan, Sandra
Sent: Thursday, January 15, 2009 7:55 AM
To: Alfano.Barbara@epamail.epa.gov
Cc: Reed, Angel
Subject: TTEMI-05-003-0051 Kerr McGee Preliminary HRS Project Update
Attachments: TTEMI-05-003-0051_Kerr McGee DVR-Data Package Status.pdf; TTEMIO-05-003-0051_Kerr McGee Project Update.pdf

Hi Barbara,

I apologize for being late with this submittal. I am not in the office right now. I am on my way to the dentist. I will be in the office around 10:00. I will call you as soon as I leave my appointment and I on my way to the office. I still need to provide the estimates on soil contamination and ground water plume. I need to confer with someone else, because I am getting too large of a number for the soils.

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Kerr McGee Chemical Corporation
Jacksonville, Duval Count, Florida
Preliminary Hazard Ranking System Project Update

Background Information

Operational activities at the Kerr McGee Chemical Corporation (KMC) included fertilizer formulating, packaging, and distribution; pesticide and herbicide formulation, blending, and packaging; the production of sulfuric acid for use in the fertilize process. A steel drum reconditioning operation reportedly was conducted at the facility at the property as well as superphosphate production. Operational activities occurred from about 1893 to 1978. In 1989, most of the on-site buildings were demolished. KMC entered into an Administrative Order on Consent (AOC) with EPA to conduct a remedial investigation (RI) and feasibility study (FS) at the site.

Several investigations have been conducted at the property. Information used for this PSS project update primarily was obtained from the 2006 RI prepared by Shaw Environmental, Inc. (Shaw) and the 2008 FS prepared by Atlanta Environmental Management (AEM) on behalf of KMC.

Sampling activities during the RI were conducted in several phases, which occurred from October 2000 to March 2005. During the RI surface and subsurface soil, groundwater, surface water, and sediment samples were collected throughout the KMC property, adjacent properties, as well as in Deer Creek and the St. Johns River.

Hazardous substances detected in on-site sources, underlying groundwater, and sediments in nearby drainage routes that are associated with the KMC facility primarily are pesticides including aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, alpha-chlordane, gamma-chlordane, DDD, DDE, DDT, dieldrin, endrin, heptachlor, heptachlor epoxide, toxaphene; PCBs; and metals including arsenic and lead. TCE and other VOCs were detected in groundwater located in the northwestern portion of the property and on off-site properties immediately northwest of the KMC property. Based on analytical results of samples collected during the multi-phased RI, the groundwater and surface water migration pathways are of primary concern at the KMC facility.

Sources identified at KMCC are listed below:

1. **Backfilled surface impoundment**

- The backfilled surface impoundment is located in the northern portion of the property north of the FASCO Building.
- The backfilled surface impoundment is covers about 75 feet by 100 feet (or 7,500 square feet [ft^2]) in area and is about 13 feet deep. The depth of sludge in the backfilled surface impoundment varies. During the RI, Shaw determined that about 1,100 cubic yards (yd^3) of sludge are contained in the backfilled surface impoundment.
- Site-related hazardous substances detected in the backfilled surface impoundment include pesticides and metals.
- The hazardous waste quantity for the backfilled surface impoundment is 100 using both area and volume.

2. **Metals contaminated soil located throughout the property**

- Arsenic and lead are the two primary metals detected at in on-site surface and subsurface soil samples. The area surrounding the machine shop contained widespread metals contamination.
- Other smaller un-quantified areas of metals contamination area located northwest and northeast of the FASCO building foundation, southeast of the specialty products warehouse, herbicide building, and sulfur storage tank.
- Background soil samples were not collected during the RI. Soil samples will be evaluated to select samples that could be used for backgrounds.
- The HWQ for the metals contaminated soil is 10.

3. **Pesticide contaminated soil located throughout the property**

- Site-related pesticides primarily were detected in the western portion of the property in areas surrounding the surface impoundment, herbicide building foundation, and pesticide storage warehouse.
- Pesticide contamination is more wide-spread in the subsurface soils in than the surface soils.
- Pesticides also were detected in surface soil surrounding the machine shop.
- Other small hot spot areas with pesticide contamination also were detected throughout the property. Pesticide contamination was detected as deep as 8 feet below ground surface (bgs).
- Background soil samples were not collected during the RI. Soil samples will be evaluated to select samples that could be used for backgrounds.

4. **PCB-Contaminated soil**

- PCBs were detected in soil samples collected in the central portion of the property (near the machine shop storeroom pad) in an area where transformers reportedly might have been located.
- PCB contamination in soil appears to be limited to this area.
- The area of PCB contaminated soil is un-quantified but greater than zero.

5. **Dredge/Fill Area**

- The dredge/fill area is located in the northern portion of the property. This area reportedly was used for drying sediment dredged from the St. Johns River. Clarified water from the surface impoundment also was pumped to this area.
- A limited number of samples have been collected from the dredge/fill area. Low concentrations of pesticides were detected in the soil samples collected during the initial phases of the RI.
- The dredge/fill area was not included in the hazardous waste quantity calculation for the KMC facility.

Based on the sources evaluated, a hazardous waste quantify of 100 is assigned for the groundwater and surface water migration pathways. The soil exposure and air migration pathways were not evaluated.

<u>Ground water Migration Pathway</u>

Permanent monitoring wells at three intervals are installed throughout the KMC property including: shallow, 13 to 20 feet bgs; intermediate, 45 to 50 feet bgs; and deep, about 75 feet bgs. In addition to on-site wells, background wells have also been installed at various location offsite for comparison to on-site

conditions. For this PSS evaluation, background ground water wells were selected for each depth interval with consideration of ground water flow in each interval.

Observed releases were documented in permanent monitoring wells in all three zones. As in the soil samples, alpha-BHC, beta-BHC, and arsenic were detected at elevated concentrations in the ground water samples. Dieldrin was also detected at elevated concentrations in ground water samples. Generally, the highest concentrations of pesticides were detected in the vicinity of the backfilled surface impoundment and former herbicide building. The presence of pesticides in these areas indicates a continued release of hazardous substances from source areas. TCE was also detected at elevated concentrations in the ground water samples located in the northwestern corner of the property and the adjacent Jaxport and Toyota properties to the north and northwest, respectively.

Groundwater plumes that are attributable to past operations at the KMC facility and their approximate aerial extent include:

- Pesticides including alpha-, beta-, gamma-BHC, dieldrin
- Arsenic located in the north and northern portion of the; some of the arsenic is located on the adjacent property to the north
- TCE and other VOCs located in the northwestern portion of the KMC property and on adjacent properties to the northwest

Targets

Municipal water within the 4-mile radius is provided by the JEA which maintains 150 wells that serve about 800,000 people. The JEA system is divided into the North and South Grids. Water from the North and South Grids has the potential to mix in the water distribution lines; therefore, the system is blended. The JEA wells are completed in the Floridan Aquifer. The top of the Floridan Aquifer is encountered at about 500 feet bgs in the vicinity of the KMC facility. Ground water flow in the Floridan Aquifer occurs in solution enlarged openings, which is characteristic of a karst aquifer. During the RI, Shaw identified about 47 potable wells within 2 miles of the KMC facility.

Preliminary Pathway Score

The draft preliminary ground water migration pathway is based on a potential to release to the Floridan Aquifer where municipal wells serve a large population in Jacksonville, Florida.

- Likelihood of Release: 90.
- Targets Value: 5,213.6. This value is based on about 28 municipal wells located within a 4 mile radius of the KMC facility. The number of municipal wells was obtained from the ESI report. Tetra Tech is the process of gathering updated target data.
- Waste Characteristics Value: 32 (toxicity/mobility of 10,000 for alpha-BHC and arsenic). A mobility value of 1 was assigned because an observed release was documented in an aquifer underlying on-site sources.

$90 \times 5{,}213.6 \times 32) \div 82{,}500 = 184.02$. Maximum value = 100

Surface Water Migration Pathway

Surface water runoff throughout the property drains toward a low area in the central portion of the property and drains into a culvert in the northeastern corner of the property near the St. Johns River. A dye trace study conducted during the RI concluded that there appears to be no discharge to the St. Johns River at this culvert. Site maps of former structures at the facility depict three drainage ditches in the eastern portion of the property. These drainage ditches reportedly discharged to the St. Johns River via outfalls. The St. Johns River flows in a northerly direction completing the 15-mile surface water migration pathway target distance limit. Surface water runoff in the southwestern portion of the KMC facility might flow towards Deer Creek; Deer Creek flows east about 0.25 mile then enters the St. Johns River. The southern and eastern portions of the site are located within the 100-year flood plan. The St. Johns River is tidally influenced in the vicinity of the KMC property.

- Sediment samples collected during previous investigations contained elevated concentrations of metals and pesticides. These hazardous substances primarily were detected near the former outfalls.
- During the RI, sediment samples were collected from the St. Johns River at and between the former outfalls as well as upstream and downstream of Deer Creek. The St. Johns River flows in a northerly direction; therefore, samples collected south of the KMC facility are used as backgrounds for comparison sediment samples collected adjacent to the site.
- Sample SD-25 collected from the St. Johns River east of the Crowley Marine Transport property was selected as the background sample.
- Sample SD-14, collected at the former loading dock east of the former fertilizer building contained the highest concentrations of most site-related hazardous substances including alpha-, beta-, and delta-BHC, DDT, dieldrin, and lead. However, sample SD-11, collected from the St. Johns River of the CSX property contained the highest concentration of aldrin.

Targets

- The St. Johns River is used for many purposes such as recreational activities including swimming, canoeing, kayaking, and sport fishing; commercial fishing; and is a habitat for many wildlife species including the West Indian Manatee.

Preliminary Pathway Score

The surface water migration pathway was scored based on an observed release to the St. Johns River with a fishery downstream and actual contamination at Level II concentrations of a sensitive environment, the Lower St. Johns Manatee Refuge. Because the St. Johns River is tidally influenced at the KMC facility area, the higher values of fresh or salt water were used for bioaccumulation factor values.

- Drinking water threat: likelihood of release, 550; targets, 5 (major or designated water recreation area for the St. Johns River); waste characteristics, 32 (toxicity/persistence value of 10,000 [dieldrin, alpha-BHC] and HWQ of 100); therefore, $550 \times 5 \times 32 \div 82{,}500 = 1.07$

- Human food chain threat: likelihood of release, 550; targets, 20 (downstream fishery); waste characteristics, 320 (toxicity/persistence/bioaccumulation value of 5E+08 [dieldrin, alpha-BHC] and HWQ of 100); therefore, $550 \times 20 \times 320 \div 82{,}500 = 42.66$

- Environmental threat: likelihood of release, 550; targets, 75 (West Indian Manatee habitat); waste characteristics, 320 (ecotoxicity/ecobioaccumulation value of 5E+8 [dieldrin, alpha-BHC] and HWQ of 100); therefore, 550 × 75 × 320 ÷ 82,500 = 160 (maximum of 60).

The surface water migration pathway score is calculated by adding the three threat scores: 1.07 (drinking water threat) + 42.66 (human food chain threat) + 60 (environmental threat) = 100.

Preliminary HRS Score

Based on the preliminary ground water and surface water migration pathway score, the overall site score for the KMC facility is:

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S pathway	S^2 pathway
Ground Water Migration Pathway Score (S_{gw})	100	10,000
Surface Water Migration Pathway Score (S_{sw})	100	10,000
Soil Exposure Pathway Score (S_s)	Not Scored	Not Scored
Air Migration Pathway Score (S_a)	Not Scored	Not Scored
$S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		20,000
$(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4$		5,000
$\sqrt{(S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2)/4}$		70.71

Data Gaps

The following data gaps have been identified during the preliminary HRS evaluation of the KMC facility.

1. Background soil samples were not collected during the multi-phases RI. Therefore, Tetra Tech evaluated soil samples collected from various locations downgradient of areas of suspected soil contamination for comparison to source with source type contaminated soil. Background samples are not needed for the backfilled surface impoundment.

2. Analytical data sheets for all samples collected do not appear to be contained in Appendix H. Tetra Tech will revisit Appendix H and will provide a list of samples anticipated to be included in the HRS documentation record for which laboratory analytical data sheets are needed.

3. Appendix L, Data Package Validation Reviews, is incomplete. Tetra Tech conducted a cross reference review between Appendix H, Analytical Results & Chain of Custody Forms and Appendix L, Data Package Validation Reviews. Data validation reports are not contained for all sample delivery groups. Sample delivery groups for which data validation reports are needed are identified in the attached spreadsheet entitled Kerr McGee DVR-Data Package Status. Also, in some cases, CLP equivalent (Level IV) data packages were available, but were not reviewed

during the data validation process. Therefore, I some cases, the data validation effort was limited to a lower level.

4. Attribution issues have been identified with adjacent and nearby facilities. Additional information is needed on the operational waste generation and disposal activities at neighboring properties. This information is needed to ensure that the observed releases evaluated for the KMC facility are attributable to past operational and waste generation/disposal activities. Also, additional information regarding assessment and remedial activities also is needed to ensure that observed releases at the KMC facility are not currently being evaluated by another entity.

5. A complete set of the file information contained in the EPA Superfund Records Center is needed for possible inclusion in the HRS documentation record.

6. The file information obtained to date contains a draft ESI report prepared by Ecology and Environment on behalf of FDEP. A final ESI report and the references cited are needed.

7. Information regarding operational history and waste generation and disposal activities are secondary references.

8. Targets for the ground water and surface water migration pathways are currently being updated.

Action Items

1. Tetra Tech will communicate with the Remedial Project Manager who is overseeing AOC activities to obtain analytical data sheets and data validation reports identified in the attachment.

2. Tetra Tech will contact JEA to obtain update information on the number and location of municipal wells. Assistance will also be requested from the FDEP Drinking Water Program.